

## TECHNICAL MEMORANDUM

TO: Carl Bach, The Boeing Company

FROM: Mario Lopez and Joe Kalmar, P.E.

DATE: 2/16/07

RE: **STORM DRAIN VIDEO INVESTIGATION  
NORTH BOEING FIELD – SEATTLE, WASHINGTON**

### INTRODUCTION

This technical memorandum provides information regarding the video investigation conducted on January 25 and 26, 2007 at North Boeing Field (NBF). The video investigation was performed to assess the condition of the north portion of the storm drain piping at NBF. The condition of the north portion of the NBF storm drain piping is of particular interest because of the presence of elevated concentrations of polychlorinated biphenyls (PCBs) found in storm drain solids sampled in this area. There have been signs of groundwater infiltration into the storm drain pipes in the north area including water flow during periods of dry weather and orange staining that appears to be the result of iron bacteria. There is also some knowledge of possible PCB sources in site soil in this area.

The storm drain video investigation was conducted by Pro-Vac of Puyallup, Washington and the work was supervised by Mario Lopez of Landau Associates, Inc. Two types of camera were utilized during the investigation. A motorized camera unit was used on lines of 6-inch diameter or larger. A push camera was used on smaller lines or in tight areas where the motorized camera would not fit. Lines that were investigated and that were separate from the main north line were performed per Carl Bach's suggestions. Some portions of the north storm drain lines could not be investigated by video camera due to a high level of standing water, blockage by solids, or blockage by piping configuration. Solids and standing water could not be cleaned out and removed from storm drains during this time due to a lack of capacity at the onsite treatment system at that time. Areas where storm drain video work was successfully completed are highlighted on the attached Figure (Figure 1). Descriptions of the findings of the video investigation are summarized in the following table.

From	To	Pipe ID	Type	Comments
MH-139	MH-138	8"	Concrete	Circular cracks in a various places with groundwater infiltration at the cracks and pipe joints

From	To	Pipe ID	Type	Comments
MH-139	Unnamed MH	8"	Concrete	At ~80' encountered a roof drain connection that protrudes halfway into the pipe. Camera unable to continue past this intrusion
Unnamed MH	MH-139	8"	Concrete	Unable to investigate. Pipe closed with a gate valve.
Unnamed MH	MH-111	8"	Concrete	Medium crack and joints offsets.
CB-146	CB-193	8"	DIP	No signs of breaks in the line
CB-146	Diversion MH-111	8"		Line full w/ water halfway in the run, unable to continue until water is removed.
MH-651	MH-652	8"	DIP	No signs of breaks in the line, solids in line
MH-651	CB-648	8"	DIP	No signs of breaks in the line, solids in line
MH-651	CB-649	8"	DIP	No signs of breaks in the line, solids in line
MH-652	CB-650	8"	DIP	No signs of breaks in the line, solids in line
MH-652	CB-162	8"	DIP/Concrete	No breaks in the DIP pipe portion. Changes to Concrete at 14.5 ft from start of run. Circular and Longitudinal cracks on the concrete side (16.5, 31, 36, 37, and 40)
MH-652	Downstream Tee	8"	Concrete	Circular cracks at 19 and 21 ft from start of run
CB-167	CB-165	8"	PVC/DIP	Major break in the line, broken connection near electrical vault. Noticed caving and exposed electrical conduit pipes.
CB-167	OWS-186	8"	DIP/Concrete	Unable to get camera through. Mainline from the separator comes in a tee, camera cannot make turn. Water infiltrating at the tee connection
CB-165	24" Tee connection	8"	PVC	No signs of breaks in the line
CB-173A	Tee	6"	PVC	No signs of breaks in the line
CB-171	Tee	6"	PVC	No signs of breaks in the line
CB-200	Tee at Flume line	6"	PVC	Line has a flapper valve to prevent backward flow. Line also forms a U shape for backflow prevention.
CB-199	CB-74-A	6"	PVC/DIP	No signs of breaks in the line
CB-184	Tee near 3-322 Bldg.	6"	PVC/DIP	No signs of breaks in the line
CB-184	Intersect north of 3-302 Bldg	12"-15"	Concrete/PVC	Pipe reduces to 12" at the intersection with CB-1 then goes back to 15". Water in the line and unable to go past PVC section. Infiltration at the tee section. Camera cannot continue past the tee
CB-191	MH-187	6"	DIP	No major breaks in the line
MH-170				
MH-193	MH-187	6"	Concrete	No signs of breaks in the line
MH-193	CB-194	6"	Concrete	Various service connections (roof drains), no major breaks in the line. Cannot continue when the pipe curves.
MH-193	CB-194	6"	Concrete	No breaks in the line. Probable sagging at the sump.
MH-170	MH-169	24"	VCP	Light infiltration through the joints
MH-169	MH-163	24"	RCP	No breaks in the line, service connection on left (from CB-165)
MH-163	MH-158	24"	RCP	No breaks in the line
MH-158	MH-152	24"	VCP	Light infiltration in the joints throughout the run.

**DRAFT**

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